

AMENDMENTS TO THE DRAWINGS

Attached hereto are three (3) sheets of additional drawings that comply with the provisions of 37 C.F.R. §1.84. The additional drawings, which include Figs. 11A, 11B and 11C, are being provided for the benefit of the Examiner. The Figs. 11A, 11B and 11C illustrate an exemplary process for loading and unloading the glass substrate into the processing chamber using the robot arm that have been described in detail in the specification as originally submitted. Accordingly, no new matter is presented.

Applicant respectfully requests that the new formal drawings be approved and made a part of the record of the above-identified application.

REMARKS

Favorable reconsideration and allowance of the present application are respectfully requested in view of the following remarks. Claims 1-8, 10-12 and 15-16 remain pending and claims 13-14 remain withdrawn from consideration. Claim 1 is independent.

OBJECTIONS TO THE DRAWINGS

The Examiner objects to the drawings and requires that additional drawings be submitted to illustrate the process for loading and unloading the substrate. *See Final Office Action, item 1.* Applicant maintains that the specification and drawings of record clearly describe the loading and unloading process. However, for the benefit of the Examiner to promote the progress of the prosecution, Figs. 11A, 11B and 11C are submitted herewith.

Applicant respectfully requests that the objections to the drawings be withdrawn.

OBJECTIONS TO THE SPECIFICATION

The Examiner alleges that the specification is replete with terms that are unclear. *See Final Office Action, item 2.* The Examiner also alleges that the sequence of load and unload operations using the sliding mechanism is not clearly described in the specification. Applicant respectfully submit that the

changes as reflected in the Substitute Specification filed on October 19, 2004 as well as the amendments to the specification made in this Reply address all issues raised.

Applicant respectfully requests that the objections to the specification be withdrawn.

OBJECTIONS TO THE CLAIMS

The Examiner objects to claim 12 for informalities and requires clarification. *See Final Office Action, item 3.* Applicant amply demonstrated that claim 12 is fully supported in the disclosure, for example in Figs. 10A, 10B and 10C, in previous Replies. However, for the benefit of the Examiner, claim 12 is amended for clarification purposes only. Accordingly, no new issues are presented.

As amended, claim 12 recites, in part “a second planar portion vertically above the first planar portion and horizontally contiguous with the first planar portion.” As illustrated in Figs. 10A, 10B and 10C, the sliding portion 42 includes a first planar portion (the left portion below the glass substrate 34) and a second planar portion (the right portion on which the glass substrate 34 slides). The second planar portion is vertically above the first planar portion and is horizontally contiguous with the first planar portion.

Applicant respectfully requests that the objections to the claims be withdrawn.

§ 112 FIRST PARAGRAPH REJECTION

Claims 1-8, 10-12 and 15-16 stand rejected under 35 U.S.C. § 112, 1st Paragraph, as allegedly failing to comply with the enablement requirement. *See Final Office Action, item 4.* Applicant respectfully submits that the submission of the new drawings and clarifications made to the specification address all issues raised by the Examiner.

Applicant respectfully requests that the rejection of claims 1-8, 10-12 and 15-16 based on Section 112, 1st Paragraph, be withdrawn.

§ 112 SECOND PARAGRAPH REJECTION

Claim 15 stands rejected under 35 U.S.C. § 112, 2nd Paragraph, as allegedly being indefinite. *See Final Office Action, items 5 and 6.* Applicant respectfully disagrees. However, for the benefit of the Examiner, claim 15 is amended for clarification purposes only. Accordingly, no new issues are presented.

Applicant respectfully requests that the rejection of claim 15 based on Section 112, 2nd Paragraph, be withdrawn.

§ 102 REJECTION – DUBOIS

Claims 1-3, 6, 11-12 and 15 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by DuBois et al. (US Patent 5,855,687). *See Final Office Action, items 7 and 8.* Applicant respectfully traverses.

Claim 1 recites “a robot arm for transferring the glass substrate onto the susceptor and returning the glass substrate from the susceptor, wherein the robot arm slides the glass substrate on the sliding portion of the susceptor.” The Examiner alleges that the robot arm sliding on the susceptor “would” be an intended use. In other words, the Examiner alleges that the feature of sliding the glass substrate with the robot arm is inherent.

MPEP is clear that in order to establish inherency, the Examiner must provide rationale or evidence showing that the missing descriptive matter is necessarily present. MPEP goes on to state, “Inherency, however, **may not be established** by probabilities or possibilities. The mere fact that a certain thing **may** result from a given set of circumstances **is not sufficient.**” Emphasis added; *See M.P.E.P. 2112 citing In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).* In other words, a mere possibility that the feature may be present is not sufficient for rejection based on inherency.

In this instance, sliding is not even a likely possibility. DuBois merely states “A wafer 28 is inserted into the chamber and placed onto the susceptor 26 by conventional robot arm and lift pins (not shown).” As one of ordinary

skill would realize, the sliding of the waver need not occur to insert the wafer into the chamber to place it onto the susceptor. Since DuBois makes no other statement regarding the wafer transfer mechanism, one cannot assume that sliding the wafer necessarily follows. At best, it is a mere possibility. Thus, the inherency of the feature is not demonstrated. Consequently, DuBois cannot teach or suggest the feature of the robot arm sliding the substrate on the susceptor. Accordingly, claim 1 is distinguishable over DuBois.

Claims 2-3, 6, 11-12 and 15 depend from independent claim 1 directly or indirectly. Accordingly, these dependent claims are also distinguishable over DuBois.

The dependent claims are also distinguishable on their own merits. DuBois clearly teaches that the recessed pocket 43 of the susceptor 26 is dimensioned to have a slightly larger diameter than the wafer. As an example, if the wafer is 150 mm in diameter, the diameter of the susceptor 26 ranges anywhere from 152.27 to 152.40 mm. *See DuBois, column 4, lines 4-14.* In other words, the maximum distance between the edge of the susceptor 26 and the edge of the substrate 14 is 1.2 mm ((152.40 – 150)/2 mm), which is much less than the numerical values recited in claims 2 and 3. Further, the Examiner does not even comment regarding on what features of DuBois he considers to be equivalent to the features as recited in claims 11-12 and 15.

Applicant respectfully requests that the rejection of claims 2-3, 6, 11-12 and 15 based on DuBois be withdrawn.

§ 103 REJECTION – CONVENTIONAL ART, TEPMAN

Claims 1-8, 10-12 and 15-16 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the Conventional Art (CA) described in the specification in view of Tepman et al. (US Patent 5,589,224). *See Final Office Action, items 9 and 10.* Applicant respectfully traverses.

First, the CA is not admitted prior art as the Examiner alleges. Therefore, any rejection that includes the CA as a basis of the rejection cannot stand.

Second, the cited reference must be considered in its entirety including disclosures that teach away from the claimed invention. *See M.P.E.P. 2141.02.* If the cited reference teaches away from the claimed invention, then the combination is improper and the rejection must fail.

In this instance, the only detailed description of the loading and unloading process disclosed in Tepman clearly teaches that the robot blade 34 never slides the substrate 14. Tepman discloses that the robot blade 34 is inserted into the chamber over the support 16. *See column 5, lines 23-28.* Once positioned, the pins 30 of the support 16 are raised to lift the substrate 14 off of the robot blade 34. *See column 5, lines 28-30.* Then the robot blade 34 is withdrawn and the pins 30 are lowered onto the support 16 (more

specifically onto the spacer support pins 35 of the support 16). *See column 5, lines 30-35.* The substrate 14 is not slid on the surface of the support 16 whatsoever. In other words, Tepman teaches away from the feature of “wherein the robot arm slides the glass substrate on the sliding portion of the susceptor” as recited in claim 1.

Following is also noted. The Examiner relies on Figure 3 to allegedly teach the feature of a groove on the susceptor. More specifically, the Examiner alleges that a channel 38 on the support 16A is equivalent to the groove as recited. However, it is noted that the edge of the substrate 14 hangs over the channel 38, i.e., there is no room for the substrate 14 to be slid on the support 16A whatsoever. Thus, even under the Examiner’s interpretation, Tepman teaches away from the feature of sliding the substrate.

In addition, one or more embodiments of the present invention are concerned with the effects of the glass substrate bending during transfer from the heat chamber to the processing chamber. In paragraph [0022] of the specification as originally filed, it is stated “Thereby, there occurs a problem whereby the glass substrate 4 is broken. The possibility of this occurrence increases because a bend of the substrate becomes severe due to the enlargement of the substrate.”

The bending of the substrate – due to the weight increase corresponding to the size increase of the glass substrate – is a concern that must be

addressed. One way to alleviate the physical stress is to slide the glass substrate as soon as practicable so that the weight of the glass substrate may be supported by the susceptor.

In contrast, Tepman does not even contemplate the possibility that the substrate may bend, and therefore would never contemplate the possibility of sliding the substrate on the susceptor. This is logical since bending would not occur for substrates of small sizes.

Regarding Figure 3, Tepman discloses that spacer means 36 are provided in the support member 16. In Figure 3, it is clearly shown that the gap 50 is uniform from one edge of the substrate 14 to the other. This can only be possible if the substrate 14 does not bend, i.e. the substrate is small. Thus, Tepman does not contemplate the possibility of the substrate bending due to its own weight and size, and therefore would not contemplate sliding the substrate at all. Indeed, sliding the substrate would provide no benefits and would add disadvantages of the film build up in this situation. Consequently, Tepman teaches against sliding the glass substrate.

In summary, when the teachings are taken in their entirety as required in MPEP, Tepman teaches away from the claimed invention. Then by definition, there is no motivation to combine the CA with Tepman and any rejection based on CA and Tepman is improper.

Applicant respectfully requests that the rejection of claims 1-8, 10-12 and 15-16 based on a combination of CA with Tepman be withdrawn.

§ 103 REJECTION – CONVENTIONAL ART, DUBOIS

Alternatively, claims 1-8, 10-12 and 15-16 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the CA in view of DuBois. *See Final Office Action, items 9 and 10.* Applicant respectfully traverses.

Like Tepman, DuBois also teaches away from the claimed invention. In DuBois, there is simply no room on the susceptor 26 to slide the wafer 28. As noted above, the diameter of the susceptor 26 upto the recessed portion 43 is barely enough to support the wafer 28. *See DuBois, Figure 4.* The groove 44 defines the edge of the recessed portion 43. DuBois discloses that the function of the groove 44 is to act as a thermal choke of the susceptor 26. This effect is achieved when the cross sectional area of the susceptor 26 is reduced at the perimeter of the wafer 28. *See DuBois, column 4, lines 22-38.* In other words, DuBois specifically teaches that the groove 44 should be aligned with the edge of the wafer 28. In doing so, there would be no room left over for any type of sliding to take place. Consequently, DuBois teaches away from the feature of sliding the glass substrate on the susceptor.

Also like Tepman, DuBois never contemplates the possibility of the wafer 28 bending due to its own weight. The exemplary wafer 28 described in

DuBois is 150 mm (roughly 6 inches) in diameter. *See DuBois, column 4, lines 4-14.* For wafers of this size, bending is simply not an issue to be addressed. Clearly, DuBois does not contemplate sliding the substrate at all and consequently teaches against sliding the glass substrate.

In summary, when the teachings of the cited references are taken in their entirety as required, DuBois teaches away from the claimed invention. Then by definition, there is no motivation to combine the CA with DuBois and any rejection based on CA and DuBois is improper.

Applicant respectfully requests that the rejection of claims 1-8, 10-12 and 15-16 based on a combination of CA with DuBois be withdrawn.

§ 103 REJECTION – DUBOIS, NAKATA

Claims 4 and 10 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over DuBois in view of Nakata (US Patent 5,119,761). *See Final Office Action, item 11.* Applicant respectfully traverses.

Claims 4 and 10 depend from independent claim 1 and it is demonstrated above that claim 1 is distinguishable over DuBois. Nakata is not relied upon to correct for at least the above-noted deficiencies of DuBois. Thus, claim 1 is distinguishable over the combination of DuBois and Nakata. Accordingly, claims 4 and 10 are also distinguishable over the combination of DuBois and Nakata for at least due to their dependencies from claim 1.

Applicant respectfully requests that the rejection of claims 4 and 10 based on DuBois and Nakata be withdrawn.

§ 103 REJECTION – DUBOIS

Claims 5 and 7-8 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over DuBois. *See Final Office Action, item 12.* Applicant respectfully traverses.

Claims 5 and 7-8 depend from independent claim 1 and it is demonstrated above that claim 1 is distinguishable over DuBois. Accordingly, claims 5 and 7-8 are also distinguishable over DuBois for at least due to their dependencies from claim 1.

Applicant respectfully requests that the rejection of claims 5 and 7-8 based on DuBois.

§ 103 REJECTION – DUBOIS, ROBERTSON

Claim 16 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over DuBois in view of Robertson (US Patent 5,366,585). *See Final Office Action, item 13.* Applicant respectfully traverses.

Claim 16 depends from independent claim 1 and it is demonstrated above that claim 1 is distinguishable over DuBois. Robertson is not relied upon to correct for at least the above-noted deficiencies of DuBois. Thus, claim

1 is distinguishable over the combination of DuBois and Robertson. Accordingly, claim 16 is also distinguishable over the combination of DuBois and Robertson for at least due to its dependency from claim 1.

Applicant respectfully requests that the rejection of claim 16 based on DuBois and Robertson be withdrawn.

CONCLUSION

All objections and rejections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance. Should there be any outstanding matters that need to be resolved, the Examiner is respectfully requested to contact Hyung Sohn (Reg. No. 44,346), to conduct an interview in an effort to expedite prosecution in connection with the present application.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant respectfully petitions for a one (1) month extension of time for filing a reply in connection with the present application, and the required fee is attached hereto.

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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachments: Three (3) New Sheets